

1/4/17 "Mistakes are the portal of Discovery." - James Joyce

HW: "Function Notation" HW
Test 3 on Tuesday 1/17

AIM: How do we evaluate functions?

Warm Up:

- 1) Express in simplest form, along with restrictions:

LCD:
 $(x+2)$
 $x \neq -2$

$$\frac{x}{x+2-x} = \left(\frac{x}{2} \right)$$

$$\frac{\frac{x}{x+2} \cdot \frac{(x+2)}{(x+2)}}{\frac{1}{1} \cdot \frac{x}{x+2} \cdot \frac{(x+2)}{(x+2)}}$$

FUNCTION NOTATION

$$y = f(x)$$

Output \uparrow Rule \uparrow Input

Exercise #1: Evaluate each of the following given the function definitions and input values.

Rule

(a) $f(x) = 5x - 2$

(b) $g(x) = x^2 + 4$

$$f(3) = 5(3) - 2 = 13$$

$$g(3) = (3)^2 + 4 = 13$$

$$f(-2) = 5(-2) - 2 = -12$$

$$g(0) = (0)^2 + 4 = 4$$

$$f(x+1) = 5(x+1) - 2$$

$$5x + 5 - 2$$

$$5x + 3$$

$$g(x-2) = (x-2)^2 + 4$$

$$(x-2)(x-2) + 4$$

$$x^2 - 4x + 4 + 4$$

$$x^2 - 4x + 8$$

Exercise #2: Boiling water at 212 degrees Fahrenheit is left in a room that is at 65 degrees Fahrenheit and begins to cool. Temperature readings are taken each hour and are given in the table below. In this scenario, the temperature, T , is a function of the number of hours, h .

h (hours)	0	1	2	3	4	5	6	7	8
$T(h)$ (°F)	212	141	104	85	76	70	68	66	65

(a) Evaluate $T(2)$ and $T(6)$.

$$T(2) = 104^\circ$$

$$T(6) = 68^\circ$$

(b) For what value of h is $T(h) = 76$?

$$h = 4$$

(c) Between what two consecutive hours will $T(h) = 100$?

Between $h=2$ and $h=3$

Exercise #3: The function $y = f(x)$ is defined by the graph shown below. Answer the following questions based on this graph.

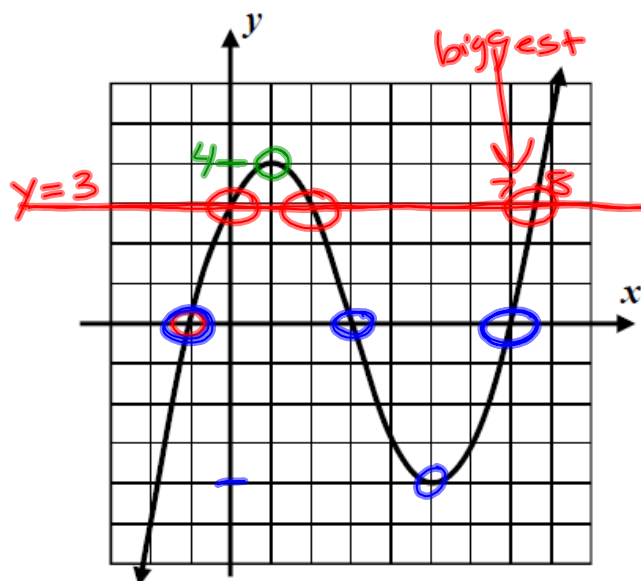
- (a) Evaluate $f(-1)$, $f(1)$, and $f(5)$.

Find the y-values

$$f(-1) = 0$$

$$f(1) = 4$$

$$f(5) = -4$$



- (b) Evaluate $f(0)$. What special feature on a graph does $f(0)$ always correspond to?

$$f(0) = 3 \quad (0, 3) \text{ y-intercept}$$

- (c) What values of x solve the equation $f(x) = 0$? where is $y = 0$?
What special features on a graph does the set @ $x = -1, 3, 7$
of x -values that solve $f(x) = 0$ correspond to?

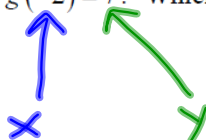
x-intercept (zeros, roots, solutions)

- (d) Between what two consecutive integers does the largest solution to $f(x) = 3$ lie?

what is the biggest x-value where $y = 3$?

between $x = 7$ and $x = 8$

Exercise #4: For a function $y = g(x)$ it is known that $g(-2) = 7$. Which of the following points must lie on the graph of $g(x)$?

(1) $(7, -2)$ (3) $(0, 7)$ (2) $(-2, 7)$ (4) $(-2, 0)$ 

Exercise #5: Physics students drop a ball from the top of a 50 foot high building and model its height as a function of time with the equation $h(t) = 50 - 16t^2$. Using TABLES on your calculator, determine, to the nearest tenth of a second, when the ball hits the ground. Provide tabular outputs to support your answer.

$$h(t) = 50 - 16t^2$$

$$y = 50 - 16x^2$$

$$t = 1.8$$

NORMAL FLOAT AUTO REAL RADIAN MP					
PRESS + FOR Δ Tb1					
X	Y1				
1	34				
1.1	30.64				
1.2	26.96				
1.3	22.96				
1.4	18.64				
1.5	14				
1.6	8.96				
1.7	3.76				
1.8	-1.84				
1.9	-7.76				
2	-14				

X=1

→ closest to zero